REMARKS

As a preliminary, Applicant and Applicant's representative thank the Examiner for the interview of June 9, 2010.

By the present amendment, claims 1 and 9 have been amended to recite that the predetermined threshold values include a threshold value of a temperature level in the vehicle exhaust line.

Accordingly, claims 8 and 16 have been amended to delete "temperature level in the vehicle exhaust line."

Further, claims 1 and 9 have been amended to delete the expression "an outlet of the oxidation catalyst-forming means feeds into an inlet of the depollution means."

New claims 21 and 22 dependent on claims 1 and 9, respectively, have been added for this recitation.

Claims 7 and 14 have been cancelled without admission, prejudice or disclaimer.

Claims 1-6, 8-13, and 15-22 are pending in the present application. Claims 1 and 9 are the only independent claims.

I. New matter rejection

In the Office Action, claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as lacking written description.

It is acknowledged in the Interview Summary that the recitation is supported in the original specification, for example, at least at col. 5, lines 12-15 as mentioned in the Remarks of the last response. Accordingly, it is submitted that the rejection should be withdrawn.

It is noted that the expression "an outlet of the oxidation catalyst-forming means feeds into an inlet of the depollution means" is now recited in dependent claims 21 and 22 dependent on claims 1 and 9, respectively.

II. Art rejections

In the Office Action, claims 1-4, 6-12, and 14-18 are rejected under 35 U.S.C. 102(e) as anticipated by US 6,490,857 to Sasaki ("Sasaki").

Further, claims 5 and 13 are rejected under 35 U.S.C. 103(a) as obvious over US 4,655,037 to Rao ("Rao").

Claims 19-20 are rejected under 35 U.S.C. 103(a) as obvious over Sasaki in view of an alleged "design choice."

Reconsideration and withdrawal of the rejections is respectfully requested.

As discussed at the interview, Figs. 26-28 of Sasaki and the corresponding description from col. 23, line 62 to col. 24, line 5, describe an intermediate mode in zone B2 (rich mode) of Fig. 6B transitioning to zone B3 (lean mode) by gradually shifting the air-fuel ratio to lean to avoid excessive increase in the temperature. Further, the sentence starting at col. 23, line 66 of Sasaki describes another embodiment where, instead of the gradual shift, the rich mode is "interrupted" by lean mode, and "the frequency of the interruption is gradually increased" (col. 24, lines 4-5).

However, this passage and Figures of Sasaki make clear that Sasaki first uses rich mode to increase temperature, then, when temperature reaches or approaches a given threshold, Sasaki shifts to lean mode, either immediately, progressively, or via "increased-frequency

interruptions." The curves at Figs. 28 of Sasaki show this steep temperature increase (with constant rich mode) followed by interruptions of the rich mode to avoid excessive temperatures.

Further, Sasaki states at col. 27, lines 55-58 that "in order to oxidize and remove the particulates, the air-fuel ratio of the surrounding atmosphere of the particulate filter must be made rich at regular intervals or at irregular intervals"). However, this particular embodiment uses NO_3 or SO_3 held on the surface of platinum in the particulate filter (see Sasaki at col. 27, lines 43-46), and the "intervals" of this embodiment are not related to threshold temperatures, i.e., Sasaki does not identify any specific mode or running conditions, let alone thresholds or ranges below which such intervals would be used.

In contrast, in the presently claimed invention, as recited in present claims 1 and 9:

- the running conditions of the vehicle are compared with predetermined threshold values including a threshold value of a temperature level in the vehicle exhaust line, and
- the engine is controlled (i) in a first regeneration operating mode by molecular O_2 combustion of the soot with a lean mixture when running conditions are above the threshold values, and (ii) in a second regeneration operating mode by molecular O_2 combustion of the soot implementing sequences in which engine operation alternates between stages of rich mixture operation and of lean mixture operation when conditions are below the threshold values.

As discussed at the interview, an advantage of the presently claimed invention is that the alternating rich/lean modes can be used to improve the temperature-increasing effect and the fuel economy of the temperature increase, i.e., below the operating threshold value (for example, by

improving combustion during each rich mode segment due to oxygen storage during the preceding lean mode segment). This is particularly helpful, for example, to assist regeneration by more quickly and efficiently raising temperature as soon as regeneration starts in unfavourable operating conditions.

Sasaki relies on continuous rich mode until threshold temperatures are reached, so Sasaki does not provide any motivation or incentive to arrive at the presently claimed invention. Further, the other references fail to remedy the deficiencies of Sasaki. Therefore, the present claims are not anticipated by Sasaki, and not obvious over the cited references taken alone or in any

Further, with respect to the dependent claims, it is submitted that Sasaki fails to teach or suggest the combined features of each of these claims.

In particular, with respect to claims 19 and 20, it is submitted that Sasaki is completely silent regarding alternating stages of rich mixture operation and of lean mixture operation that include at least a first stage of rich mixture operation, followed by a second stage of lean mixture operation, followed by a third stage of rich mixture operation, wherein the rich mixture operation stages have approximately a same duration. More specifically, Sasaki relies only on setting a rich mode with sub injections in determined conditions of engine load area B1 or B2, or setting a lean mode in other determined conditions of engine load areas, until regeneration is performed, or until engine load changes to a different area. Thus, Sasaki does not allow minimization of rich mode utilization during phases B1 or B2.

In contrast, an advantage of the feature of claims 19 and 20 is that the alternating periods for the second operating mode, with rich mode operation stages of approximately a same duration interspaced by a lean mode operation stage, make it possible to optimize in a simple manner both a boost to regeneration in unfavourable conditions and a promotion of lean mode utilization in such conditions, as illustrated on Fig. 2.

Further, the other cited reference fails to remedy the deficiencies of Sasaki.

Therefore, each of the respective dependent claims, and in particular, each of claims 19 and 20, is not obvious over the cited references taken alone or in any combination.

In view of the above, it is submitted that the rejections should be withdrawn.

Conclusion

In the event there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to our Deposit Account No. 502759.

Respectfully submitted,

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